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ABSTRACT

Two experiments were conducted to determine a possible relationship between the right hemisphere, music perception, and mental imagery. The first experiment compared two groups of college students, one of which showed a preference for left hemisphere thinking (n=22) and the other a preference for right hemisphere thinking (n=20), in order to test the hypothesis that right hemisphere subjects would have more vivid imagery and that music would facilitate imagery in both groups. A total of 19 students filled out the questionnaire on imagery in silence while the remaining 23 did so while listening to classical music. Results indicated that while right hemisphere subjects consistently recorded more vivid images under silent conditions, there was no appreciable difference in image formation recorded while listening to music. This suggests that music may inhibit image formation among right hemisphere individuals while facilitating imagery in left hemisphere individuals. In a follow-up experiment to test the relationship between image formation and interference, two groups of students listened to electronic music for 15 minutes and then recorded their reactions. Right hemisphere subjects recorded three times as many images as left hemisphere subjects, thus supporting the idea that playing music while requiring right hemisphere subjects to form special images creates interference between music-elicited images and the suggested images. (LP)

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Music, Hemisphere Preference and Imagery

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Abstract

In Experiment 1, subjects rated the vividness of suggested images in silence or with background music. Right hemisphere subjects had more vivid images in silence than left hemisphere subjects, but less vivid images with music playing. If music leads to more imagery in right hemisphere subjects, it is likely that interference occurred between the music-elicited images and the suggested images. Experiment 2 tested this hypothesis by having subjects listen to music for 15 minutes and then describe their reactions. Right hemisphere subjects had far more images than left hemisphere subjects and also more emotions. Left hemisphere subjects had more thoughts and sensations. These results support the suggestion that interference occurred in Experiment 1, and also indicate the importance of hemisphere preference in determining how one reacts to music.

Music, Hemisphere Preference and Imagery

In recent years, a great deal of research has been aimed at determining the different functions of the left and right hemispheres of the cerebral cortex. The left hemisphere has been associated with analytical, mathematical, sequential and logical thinking. The right hemisphere, conversely, has been associated with conceptual, holistic, spatial and creative thinking. Two recent books (Segalowitz, 1983; Springer and Deutsch, 1981) provide a complete review of the many specialized functions attributed to each hemisphere. Two such activities which are believed to be controlled by the right hemisphere, music perception and mental imagery, were the focus of these studies.

Experiment 1

This study was designed to experimentally determine the ability of music to influence imagery. Not only are both of these associated with the right hemisphere, but some research has suggested that imagery is the primary response to music (Osborne, 1981). This experiment compared subjects who showed a preference for left hemisphere thinking with those who showed a preference for right hemisphere thinking. It was hypothesized that right hemisphere subjects would have more vivid imagery than left hemisphere subjects and that music would facilitate imagery for both types of subjects.

Method

Subjects. The subjects were 42 college students enrolled in an introductory psychology course. The subjects were volunteers from two groups chosen from a pool of 200 students who had been tested with the "Your Style of Learning and Thinking" test (Torrance, et al, 1977) which measures left-right hemisphere preference. Twenty subjects had a right hemisphere preference and 22 had a left hemisphere preference.

Procedure. The subjects were run in small groups of two to six. They were given a two-part questionnaire on imagery. The first part was based on Sheehan's (1967) shortened form of Betts' questionnaire on mental imagery, and required the subjects to rate the vividness of the images they formed of 40 suggested stimuli. A seven point rating scale was used with 1 indicating the image was just as clear as if the stimulus was actually present and 7 indicated no image was present. All sensory modes were included: vision, hearing, touch, smell, taste, movement, and sensations. The second part was a test of imagery controllability and required rating the ease of changing one visual image to another. Ten successive changes were required.

Nineteen subjects filled out the questionnaire in silence (8 rights and 11 lefts) and 23 subjects filled it out with background music playing (12 rights and 11 lefts).

Soothing classical music was used with selections from Hayden and Mozart.

Results and Discussion

Table 1 shows the mean vividness rating given by subjects in each condition. It can be seen that, under the silence condition, the right hemisphere subjects consistently had more vivid images and were more capable of changing and manipulating images than the left hemisphere subjects. However, under the music condition, there was little or no difference between left and right hemisphere subjects. The right hemisphere subjects had less vivid imagery with music playing than in silence, and the left hemisphere subjects had slightly more vivid imagery with music than in silence. Likewise, ability to change images was influenced in the same way. These results were consistent across all the sensory modes.

The silence condition of this study, thus, appears to confirm ideas about right hemisphere people being better at imagery. The music condition findings are interesting since they suggest that music may inhibit imagery in right hemisphere thinkers, but facilitate the process in left hemisphere thinkers. Since this was not predicted in the hypothesis, possible explanations were sought. Some researchers have suggested that interference may occur if two same-hemisphere activities are engaged in simultaneously. If listening to music stimulates imagery on its own, and

this is primarily a right hemisphere activity, then music may lead to interference for right hemisphere subjects when they are asked to form other images as in the questionnaire. Such interference would not occur for left hemisphere thinkers.

Experiment 2

Following the findings in Experiment 1, this study was designed to test the interference hypothesis. Osborne (1981) found that subjects reported more images than thoughts, emotions, or sensations after listening to "spacy" electronic music. This experiment replicated Osborne's procedure, but compared right hemisphere and left hemisphere subjects, predicting that right hemisphere subjects would have more imagery in response to music.

Method

Subjects. The subjects were 32 college students enrolled in either an introductory psychology or music appreciation course. Seventeen subjects had a right hemisphere preference and 15 had a left hemisphere preference; hemisphere preference was determined in this study by testing with the Herrmann Brain Dominace Instrument (Herrmann, 1983).

Procedure. Subjects were asked to lie down on a mat in a carpeted room with subdued lighting and were given a brief relaxation exercise. They were instructed to give their total attention to the music, and were then left

alone to listen to 15 minutes of spacy, free form harp music. Following the music, subjects were asked to speak into a tape recorder and describe their reactions to the music including thoughts, emotions, sensations, and images.

Results and Discussion

Table 2 shows the mean number of thoughts, emotions, sensations and images reported by both groups of subjects. The right hemisphere subjects reported three times more images than left hemisphere subjects. They also had more than twice as many emotions. The left hemisphere subjects reported primarily thoughts and sensations. Six of the lefts reported no images at all, while only one right reported no images. These results strongly support the idea that playing music while requiring right hemisphere subjects to form specific images creates interference as suggested by the results of Experiment 1. The music itself will elicit images in right hemisphere subjects, making it more difficult to form the images suggested by the questionnaire. Left hemisphere subjects, however, may be slightly aided by the music if it possibly activates the right hemisphere but does not elicit images. Hemisphere preference is thus an important variable to consider in examining responses to music.

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Table 1

Imagery Vividness Ratings

		Hemisphere Preference	
		Right	Left
Visual	No Music	2.00	2.62
	Music	2.56	2.54
Auditory	No Music	1.93	3.13
	Music	3.01	2.76
Touch	No Music	1.75	2.40
	Music	2.73	2.36
Movement	No Music	1.98	2.93
	Music	2.37	2.84
Taste	No Music	2.63	3.29
	Music	3.30	2.67
Smell	No Music	1.90	3.00
	Music	2.70	2.76
Sensations	No Music	2.40	2.45
	Music	2.55	2.56
Change	No Music	2.06	2.76
	Music	2.47	2.65

Table 2

Reactions to Music

	Hemisphere Preference	
	Right	Left
Thoughts	2.41	3.00
Emotions	1.88	.73
Sensations	1.82	2.13
Images	3.12	1.07